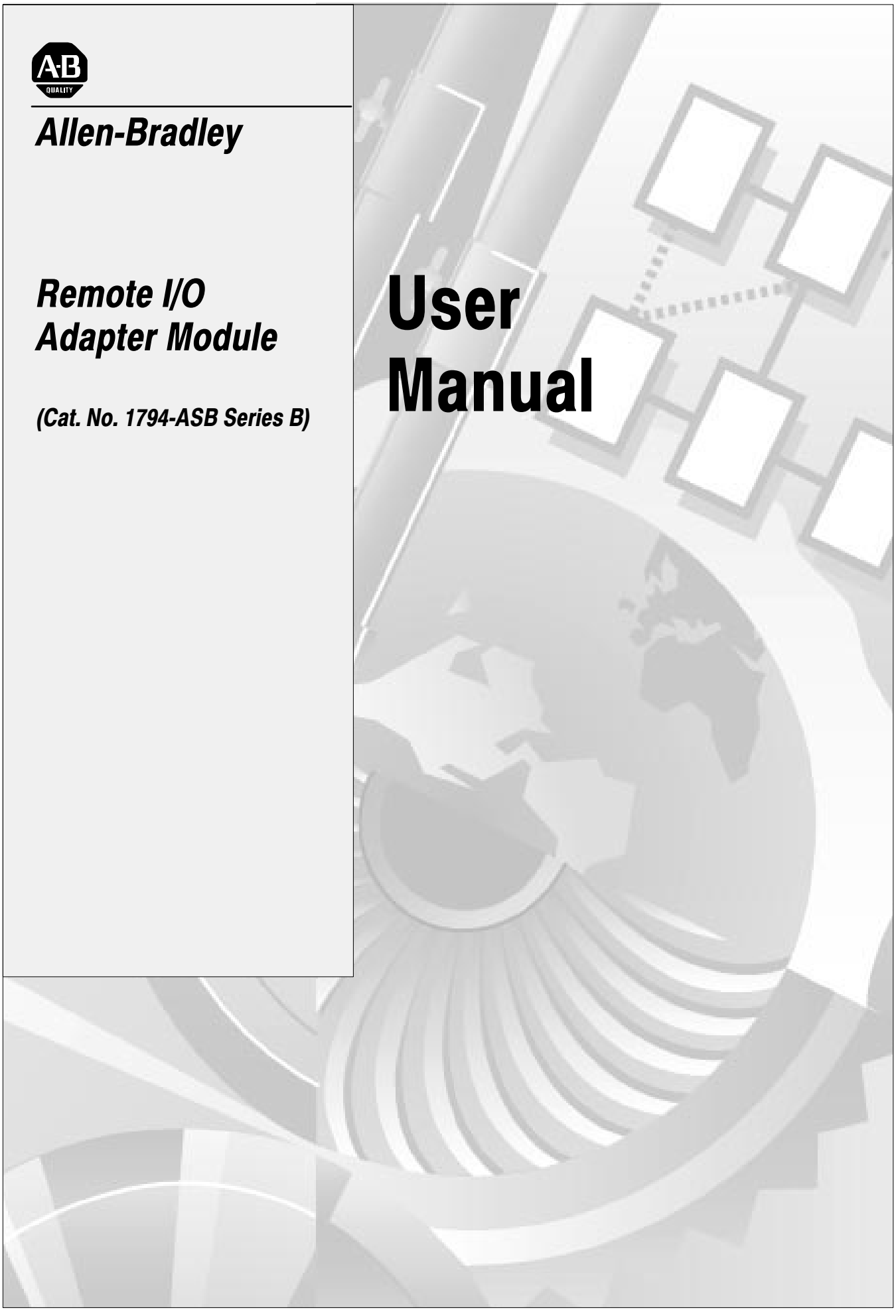


Allen-Bradley

Remote I/O Adapter Module

(Cat. No. 1794-ASB Series B)

User Manual

Important User Information

Because of the variety of uses for the products described in this publication, those responsible for the application and use of this control equipment must satisfy themselves that all necessary steps have been taken to assure that each application and use meets all performance and safety requirements, including any applicable laws, regulations, codes and standards.

The illustrations, charts, sample programs and layout examples shown in this guide are intended solely for example. Since there are many variables and requirements associated with any particular installation, Allen-Bradley does not assume responsibility or liability (to include intellectual property liability) for actual use based upon the examples shown in this publication.

Allen-Bradley publication SGI–1.1, “Safety Guidelines For The Application, Installation and Maintenance of Solid State Control” (available from your local Allen-Bradley office) describes some important differences between solid-state equipment and electromechanical devices which should be taken into consideration when applying products such as those described in this publication.

Throughout this manual we make notes to alert you to possible injury to people or damage to equipment under specific circumstances.

ATTENTION: Identifies information about practices or circumstances that can lead to personal injury or death, property damage or economic loss.

Attention helps you:

- Identify a hazard.
- Avoid the hazard.
- Recognize the consequences.

Important: Identifies information that is especially important for successful application and understanding of the product.

Important: We recommend you frequently backup your application programs on appropriate storage medium to avoid possible data loss.

Summary of Changes

This publication contains new and revised information not included in the last release.

New Information

Series A and Series B Differences

The remote I/O adapter is now a series B. The series A adapters and the series B adapters process block transfers differently.

Series A adapters allow block transfers to continue to occur even when an analog module is removed from its base.

With series B adapters, when a module is removed from its terminal base, the series B adapter ceases to do block transfers to the processor and a block transfer error bit is set in the processor. This provides feedback to the processor that a block transfer module has been removed.

Important: The “hold inputs” feature, selectable on the switch assembly on the adapter, will not apply to analog modules. If you need this feature, you must simulate this feature in your programming.

Additional Flex I/O Modules

Three new FLEX I/O modules have been added to this publication.

- 1794-IB10XOB6 input/output combination module
- 1794-IR8 RTD input analog module
- 1794-IT8 Thermocouple/mV input analog module

European Union Directives Compliance

Information has been added to identify adherence to the required directives when the module is CE marked.

Revised Information

Three analog modules have undergone a series change. These modules are:

- 1794-OE4 series B 4 output analog module
- 1794-IE8 series B 8 input analog module
- 1794-IE4XOE2 series B 4 in/2 out combo analog module

I/O Mapping

I/O mapping for the series B versions of the analog modules has been added. In addition, the 1794-IR8 and 1794-IT8 module I/O mapping is also included.

Change Bars

The areas in this manual which are different from previous editions are marked with change bars (as shown next to this paragraph) to indicate the addition of new or revised information.

Table of Contents

Using This Manual

Preface Objectives

Read this preface to familiarize yourself with this manual and to learn how to use it properly and efficiently.

Audience

We assume that you have previously used an Allen–Bradley programmable controller, that you are familiar with its features, and that you are familiar with the terminology we use. If not, read the user manual for your processor before reading this manual.

Vocabulary

In this manual, we refer to:

- the individual adapter module as the “adapter.”
- the programmable controller as the “controller” or the “processor.”
- input and output modules as the “module.”

What This Manual Contains

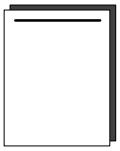
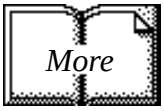
The contents of this manual are as follows:

Table P. A
What This Manual Contains

Chapter	Title	What's Covered
1	Overview of FLEX I/O and the Remote I/O Adapter Module	Describes features, capabilities, and hardware components.
2	Installing Your Remote I/O Adapter	Procedures and guidelines for installing the module
3	Communicating with FLEX I/O Modules	Hardware addressing and configuration options
4	Troubleshooting	Troubleshooting aids
Appendix	**Title**	**What's Covered**
A	Specifications	Module specifications

Conventions

We use these conventions in this manual:

In this manual, we show:	Like this:
that there is more information about a topic in another chapter in this manual	
that there is more information about the topic in another manual	

For Additional Information

For additional information on FLEX I/O systems and modules, refer to the following documents:

Catalog Number	Voltage	Description	Publications	
			Installation Instructions	User Manual
1794		1794 FLEX I/O Product Data	1794-2.1	
1794-ACN	24V dc	ControlNet Adapter	1794-5.8	
1794-ADN	24V dc	DeviceNet Adapter	1794-5.14	1794-6.5.5
1794-ASB	24V dc	Remote I/O Adapter	1794-5.11	1794-6.5.3
1794-TB2 1794-TB3		2-wire Terminal Base 3-wire Terminal Base	1794-5.2	
1794-TBN		Terminal Base Unit	1794-5.16	
1794-TBNF		Fused Terminal Base Unit	1794-5.17	
1794-TB3T		Temperature Terminal Base Unit	1794-5.41	
1794-IB16	24V dc	16 Input Module	1794-5.4	
1794-OB16	24V dc	16 Output Module	1794-5.3	
1794-IB10XOB6	24V dc	10 Input/6 Output Module	1794-5.24	
1794-IE8	24V dc	Selectable Analog 8 Input Module	1794-5.6	
1794-OE4	24V dc	Selectable Analog 4 Output Module	1794-5.5	1794-6.5.2
1794-IE4XOE2	24V dc	4 Input/2 Output Analog Module	1794-5.15	
1794-IR8	24V dc	8 RTD Input Analog Module	1794-5.22	1794-6.5.4
1794-IT8	24V dc	8 Thermocouple Input Module	1794-5.21	1794-6.5.7
1794-IB8S	24V dc	Sensor Input Module	1794-5.7	
1794-IA8	120V ac	8 Input Module	1794-5.9	
1794-OA8	120V ac	Output Module	1794-5.10	
1794-CE1		Extender Cable	1794-2.12	
1794-NM1		Mounting Kit	1794-2.13	
1794-PS1	24V dc	Power Supply	1794-5.35	

Summary

This preface gave you information on how to use this manual efficiently. The next chapter introduces you to the remote I/O adapter module.

Overview of FLEX I/O and your Remote I/O Adapter Module

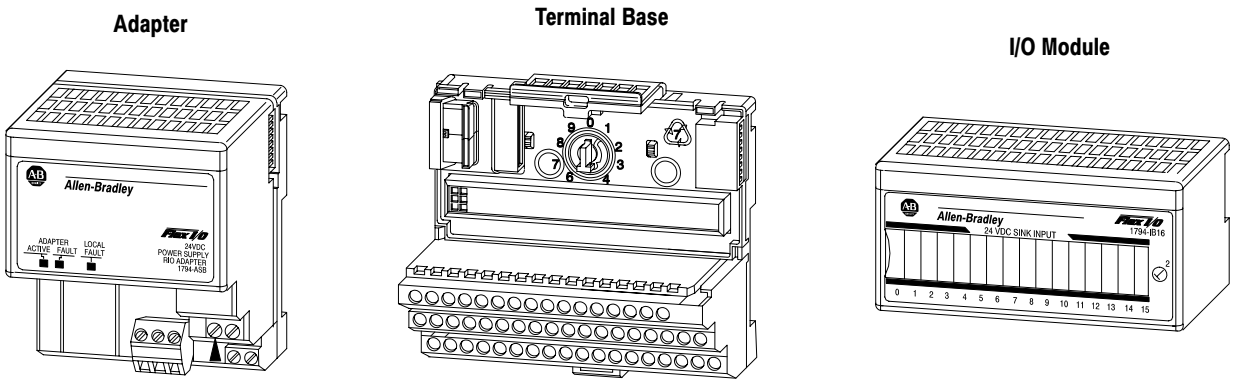
Chapter Objectives

In this chapter, we tell you about:

- what the FLEX I/O system is and what it contains
- how FLEX I/O modules communicate with programmable controllers
- the features of your adapter module

The FLEX I/O System

FLEX I/O is a small, modular I/O system for distributed applications that performs all of the functions of rack-based I/O. The FLEX I/O system contains the following components shown below:

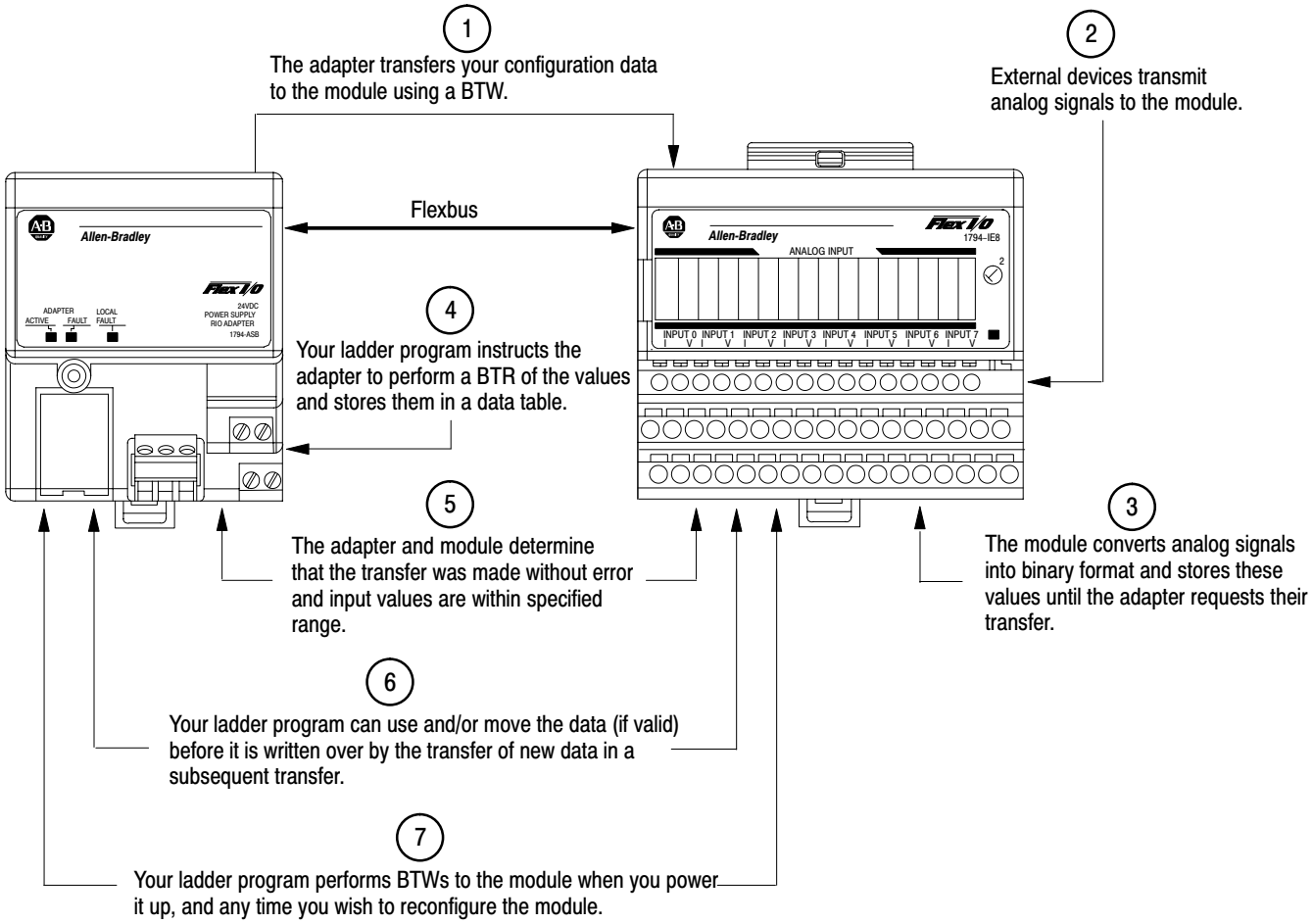


- adapter/power supply – powers the internal logic for as many as eight I/O modules
- terminal base – contains a terminal strip to terminate wiring for two- or three-wire devices
- I/O module – contains the bus interface and circuitry needed to perform specific functions related to your application

How FLEX I/O Modules Communicate with Programmable Controllers

Data transfer to and from the remote I/O adapter/power supply and discrete I/O modules occurs every flexbus scan. This provides the controller with updated data.

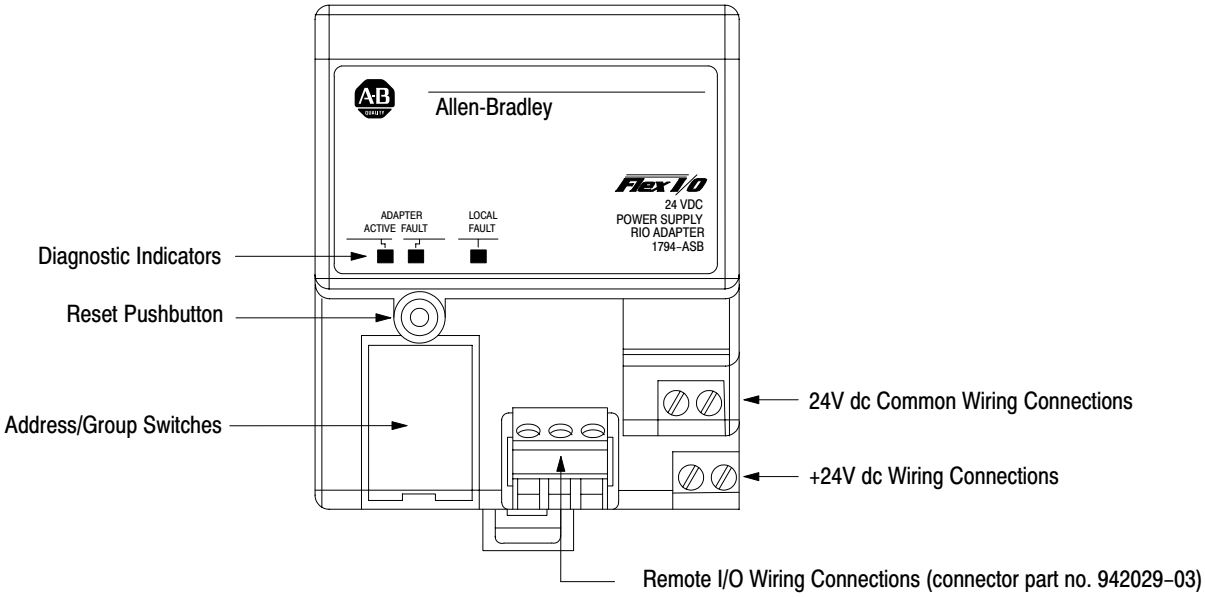
The remote I/O adapter/power supply transfers data to the analog I/O module (block transfer write) and from the analog I/O module (block transfer read) using BTW and BTR instructions in your ladder diagram program. These instructions let the adapter obtain input values and status from the I/O module, and let you send output values to establish the module's mode of operation. The communication process is described in the following illustration.



Hardware Components

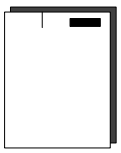
The adapter module consists of the following major components:

- diagnostic indicators
- reset pushbutton
- remote I/O wiring connections
- 24V dc power wiring connections
- address/group switch assemblies



Diagnostic Indicators

Diagnostic indicators are located on the front panel of the adapter module. They show both normal operation and error conditions in your remote I/O system. The indicators are:



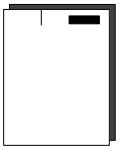
- Adapter ACTIVE (green)
- Adapter FAULT (red)
- LOCAL FAULT (red)

A complete description of the diagnostic indicators and how to use them for troubleshooting is explained in chapter 4.

Reset Pushbutton

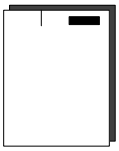
Use the reset pushbutton to reset the adapter module and resume communication when a communication error occurs. (The adapter's processor restart lockout switch (PRL) must be in the "locked out" position.) If the adapter is not locked out by the PRL switch, it will be automatically reset via special commands sent over the communication link.

Important: Do not cycle power to the adapter to clear a fault. All queued block transfer instructions will be lost.



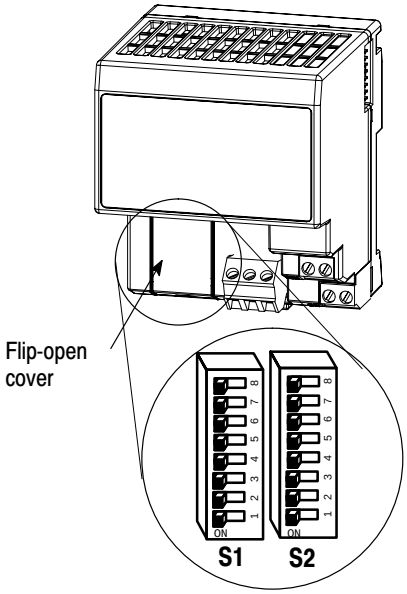
Remote I/O Wiring

The remote I/O wiring termination is made to a plug-in connector on the front of the adapter module. Refer to Chapter 2 for information on wiring the connector.



Power Wiring

Connections are provided for connecting the required 24V dc power to the front of the module. The power wiring can be daisy-chained to the terminal base unit located next to the adapter to supply power to the module installed in that base unit. Wiring information is shown in Chapter 2.



Address Switch Assemblies

Multi-position switches are provided for:

- starting I/O group – 0, 2, 4 or 6
- rack number
- hold inputs – hold or reset
- last chassis – yes or no
- reply delay – this switch position should always be on
- communication rate – 57.6, 115.2, or 230.4k bits/s
- processor restart lockout (PRL)
- hold last state (for outputs)

These switches are accessed by lifting the hinged cover on the front of the module. Refer to Chapter 2 for switch settings.

Chapter Summary

In this chapter you learned about the FLEX I/O system and features of the remote I/O adapter module.

Installing Your Remote I/O Adapter Module

Chapter Objectives

This chapter describes the procedures for installing your remote I/O adapter module. These include:

- power requirements
- mounting the remote I/O adapter
- setting the module switches

European Union Directive Compliance

If this product has the CE mark it is approved for installation within the European Union and EEA regions. It has been designed and tested to meet the following directives.

EMC Directive

This product is tested to meet Council Directive 89/336/EEC Electromagnetic Compatibility (EMC) and the following standards, in whole or in part, documented in a technical construction file:

- EN 50081-2EMC – Generic Emission Standard, Part 2 – Industrial Environment
- EN 50082-2EMC – Generic Immunity Standard, Part 2 – Industrial Environment

This product is intended for use in an industrial environment.

Low Voltage Directive

This product is tested to meet Council Directive 73/23/EEC Low Voltage, by applying the safety requirements of EN 61131–2 Programmable Controllers, Part 2 – Equipment Requirements and Tests.

For specific information required by EN 61131-2, see the appropriate sections in this publication, as well as the following Allen-Bradley publications:

- Industrial Automation Wiring and Grounding Guidelines For Noise Immunity, publication 1770-4.1
- Guidelines for Handling Lithium Batteries, publication AG-5.4
- Automation Systems Catalog, publication B111

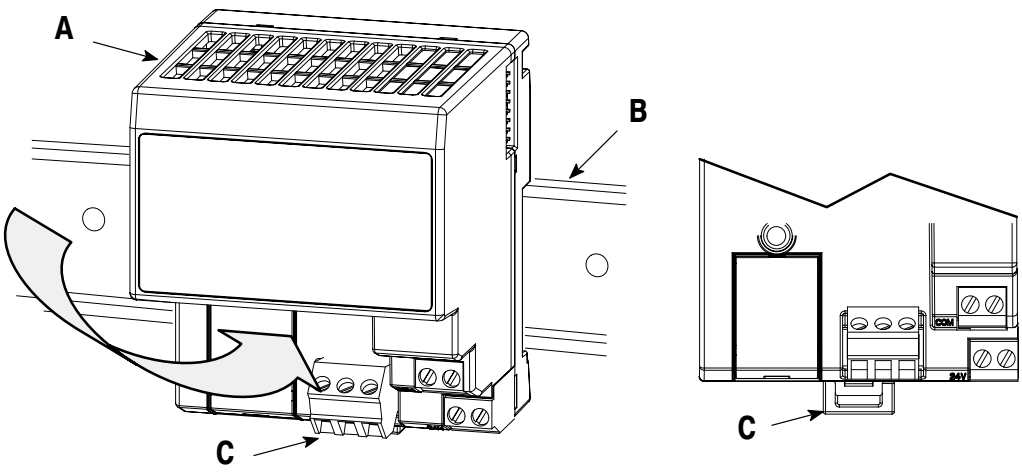
Power Requirements

The Remote I/O adapter module requires a current of 450mA at 24V dc from an external power supply for flexbus operation. This is sufficient to support the flexbus current requirements one logical rack (8 modules). Remember to add this amount to current requirements for other modules using the same 24V supply.

Mounting the Remote I/O Adapter

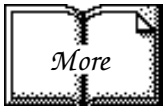
The remote I/O adapter module can be DIN rail or wall/panel mounted. Refer to the specific method of mounting below.

Mounting on the DIN Rail



1. Position the remote I/O adapter module **A** on a 35 x 7.5mm DIN rail **B** (A-B pt. no. 199-DR1; 46277-3; EN 50022) at a slight angle.
2. Rotate the adapter module onto the DIN rail with the top of the rail hooked under the lip on the rear of the adapter module.
3. Press the adapter module down onto the DIN rail until flush. Locking tab **(C)** will snap into position and lock the adapter module to the DIN rail.

   If the adapter module does not lock in place, use a screwdriver or similar device to move the locking tab down while pressing the adapter module flush onto the DIN rail and release the locking tab to lock the adapter module in place. If necessary, push up on the locking tab to lock.
4. Connect the adapter wiring as shown under “Wiring” later in this document.



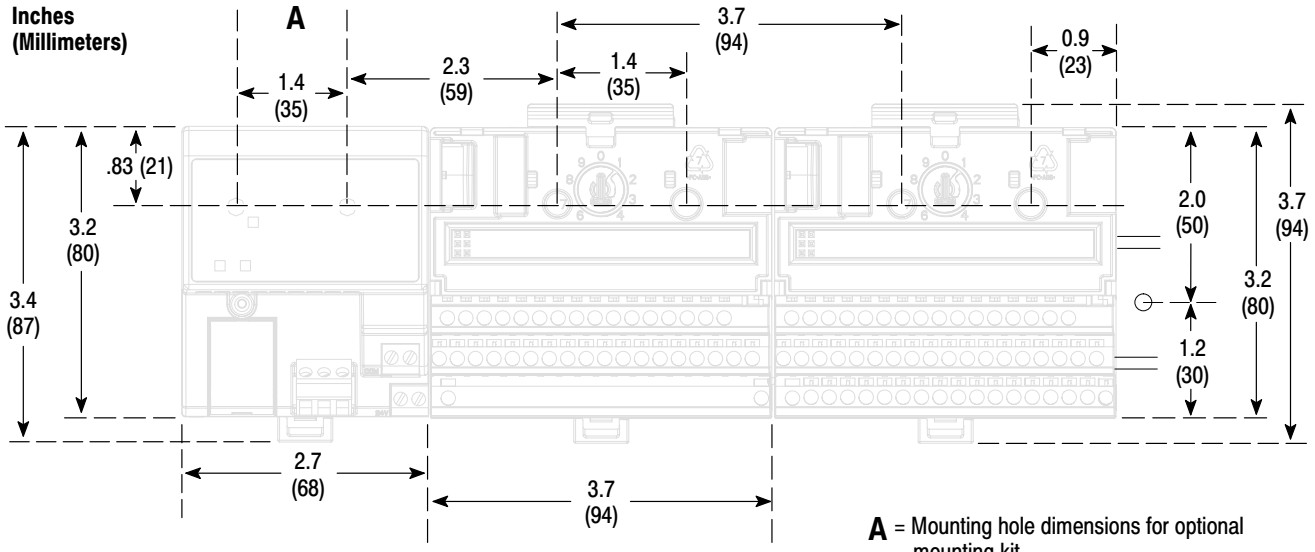
Important: Make certain that the DIN rail is properly grounded to the panel. Refer to “Industrial Automation Wiring and Grounding Guidelines for Noise Immunity,” publication 1770-4.1.

Mounting on a Wall or Panel

To mount the remote I/O adapter module on a wall or panel, you must have the 1794-NM1 mounting kit. The kit contains a special plate and screws necessary for wall/panel mounting. Proceed as follows:

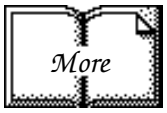
Install the mounting plate on a wall or panel as follows:

1. Lay out the required points on the wall/panel as shown in the drilling dimension drawing.

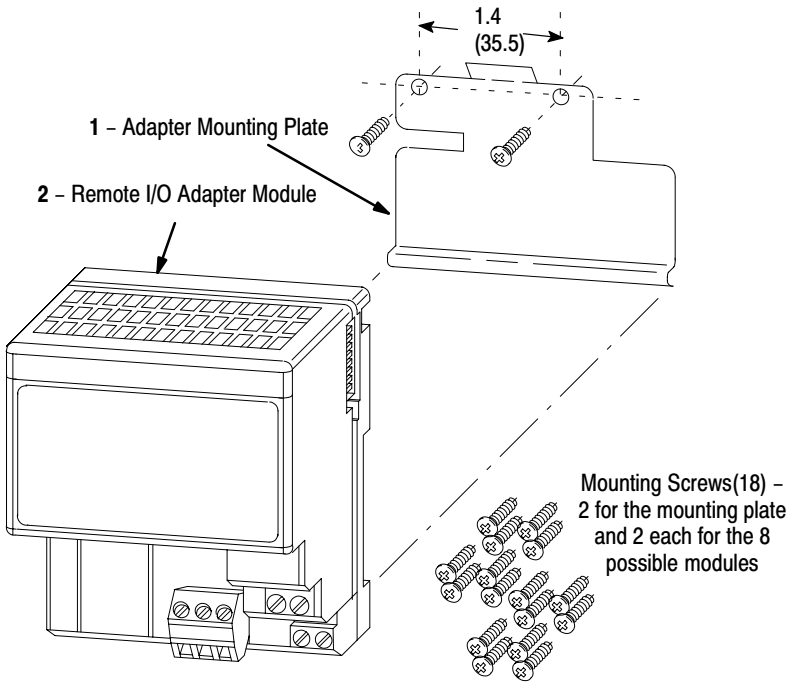


2. Drill the necessary holes for #6 self-tapping mounting screws.

3. Mount the mounting plate (1) for the adapter module using two #6 self-tapping screws (18 included).



Important: Make certain that the mounting plate is properly grounded to the panel. Refer to "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity," publication 1770-4.1.

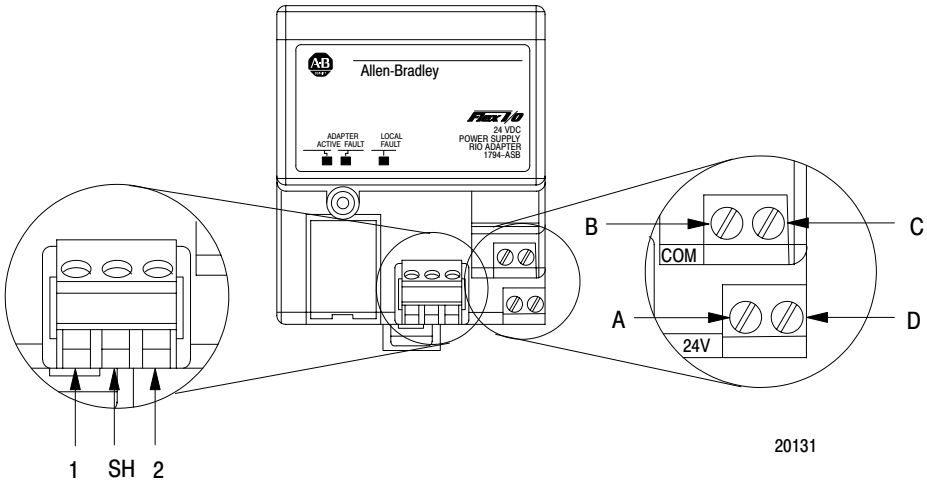


4. Hold the adapter (2) at an angle and engage the top of the mounting plate in the indention on the rear of the adapter module.
5. Press the module down flush with the panel until the locking lever locks.
6. Position the termination base unit up against the adapter and push the female bus connector into the adapter.
7. Secure to the wall with two #6 self-tapping screws.
8. Repeat for each remaining terminal base unit.

Note: The adapter is capable of addressing eight modules. Do not exceed a maximum of eight terminal base units in your system.

Wiring

Connect external wiring to the remote I/O adapter as shown below.



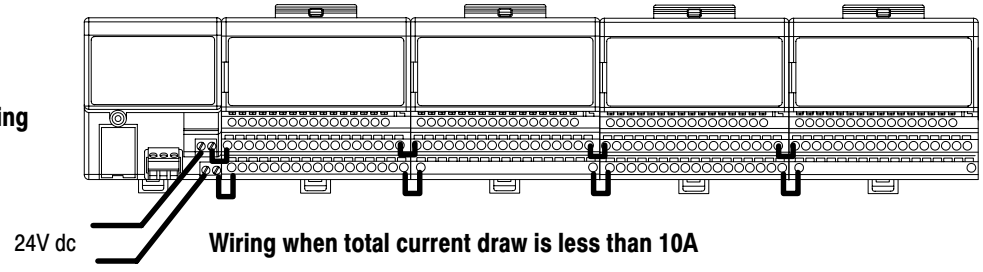
1. Connect the remote I/O cable to the removable plug-in remote I/O connector.

Connect	To
Blue Wire – RIO	1
Shield Wire – RIO	SH
Clear Wire – RIO	2

2. Connect +24V dc input to the left side of the lower connector terminal **A**.
3. Connect 24V common to the left side of the upper connector terminal **B**.
4. Connections **C** and **D** are used to pass 24V dc power and common to the next module in the series (if required).

For example:

Daisy-chaining



Wiring when total current draw is less than 10A

Note: All modules must be either analog or discrete. Do not mix analog and discrete modules when using the daisy-chain wiring scheme.

Note: Refer to the individual instructions for each module for actual wiring information.

Setting the Switches

The remote I/O adapter module has two 8-position switch assemblies which you set for:

- starting I/O group
- I/O rack number
- hold inputs
- last chassis
- reply delay (always on)
- communication rate
- processor restart lockout (PRL)
- hold last state (outputs)

Starting I/O Group

The starting I/O group is the first group of input and output circuits that correspond to one word in both the input and output image tables. These starting I/O groups are numbered 0, 2, 4 and 6. In FLEX I/O, one I/O group corresponds to one I/O module.

I/O Rack Number

One I/O rack number is 8 I/O groups. One FLEX I/O module is designated as 1 I/O group (1 word of input and 1 word of output). You cannot have more than 1 rack number per adapter. For an example, refer to “Determining Rack Size” on page 3–2.

Hold Inputs

When hold inputs is enabled (S2-7 on), the adapter will retain the last memory image present when you remove the discrete module from its base. These inputs are held until the correct module is placed back in the base. If the same type of module is reinserted into the base, its inputs will be transferred. If a different type of module is inserted in the base, its memory image will go to zero. Any associated outputs will also go to zero.

Last Chassis

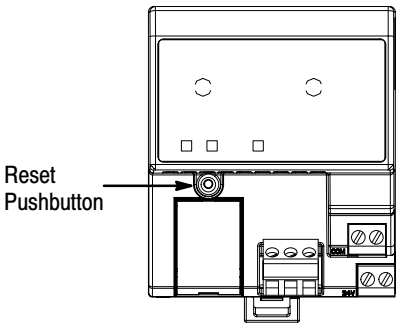
When last chassis is enabled (S2-6 off), this adapter contains the highest numbered I/O group for the associated rack number. (This switch is used for PLC-2 processors only.)

Reply Delay

This switch position is reserved for future use. This switch should always be on.

Communication Rate

You set these switches (S2-3 and S2-4) for the desired communication rate (in bits/s). Selections are:
57.6k bits/s
115.2k bits/s
230.4k bits/s



Processor Restart Lockout

When PRL is disabled (switch S2-2 on), the programmable controller can restart communication with the adapter in the event of a communication fault.

When PRL is enabled (switch S2-2 off), the programmable controller cannot restart communication with the adapter in the event of a communication fault. In this case, you must press the restart pushbutton on the front of the adapter module to restart communication.

Hold Last State

During a communication error, when last state is enabled (S2-1 set to off), a processor reset will keep the discrete outputs in their present (last) state; when last state is disabled, the discrete outputs will reset.

The switch assemblies are located under a flip-open cover on the front of the adapter module.

Starting I/O Group		
S1–8	**S1–7**	**Module group**
ON	ON	0 (1st quarter)
OFF	ON	2 (2nd quarter)
ON	OFF	4 (3rd quarter)
OFF	OFF	6 (4th quarter)

I/O Rack Number
S1–6 thru S1–1
Refer to page 2–9

S2–8	
ON	Reserved

S2–7	Hold Inputs
ON	Hold Inputs
OFF	Reset Inputs

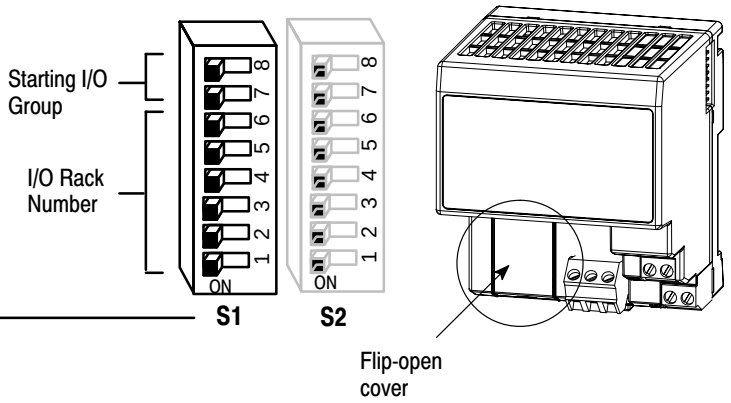
S2–6	Last Chassis[1]
ON	Not last
OFF	Last

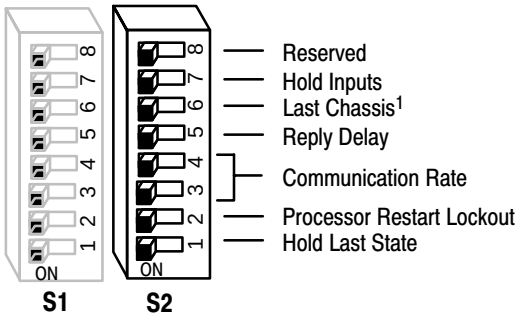
S2–5	Reply Delay
ON	Reserved

Communication Rate		
S2–4	**S2–3**	**Bits/s**
ON	ON	57.6k
OFF	ON	115.2k
ON	OFF	230.4k
OFF	OFF	230.4k

Processor Restart Lockout (PRL)	
S2–2	**Processor:**
ON	Restart
OFF	Locked out

Hold Last State	
S2–1	**Processor will:**
ON	Reset outputs
OFF	Hold last state





[1] **For PLC-2 Processors only –**

OFF – this adapter **does** contain the highest numbered I/O group for the associated rack number.

ON – this adapter **does not** contain the highest numbered I/O group for the associated rack number.

Rack Number						S1 Switch Position					
1747-SN	1771-SN	PLC-2	PLC-5	PLC-5/250	PLC-3	6	5	4	3	2	1
Rack 0	Rack 1	Rack 1	Not Valid	Rack 0	Rack 0	ON	ON	ON	ON	ON	ON
Rack 1	Rack 2	Rack 2	Rack 1	Rack 1	Rack 1	OFF	ON	ON	ON	ON	ON
Rack 2	Rack 3	Rack 3	Rack 2	Rack 2	Rack 2	ON	OFF	ON	ON	ON	ON
Rack 3	Rack 4	Rack 4	Rack 3	Rack 3	Rack 3	OFF	OFF	ON	ON	ON	ON
	Rack 5	Rack 5	Rack 4	Rack 4	Rack 4	ON	ON	OFF	ON	ON	ON
	Rack 6	Rack 6	Rack 5	Rack 5	Rack 5	OFF	ON	OFF	ON	ON	ON
	Rack 7	Rack 7	Rack 6	Rack 6	Rack 6	ON	OFF	OFF	ON	ON	ON
			Rack 7	Rack 7	Rack 7	OFF	OFF	OFF	ON	ON	ON
			Rack 10	Rack 10	Rack 10	ON	ON	ON	OFF	ON	ON
			Rack 11	Rack 11	Rack 11	OFF	ON	ON	OFF	ON	ON
			Rack 12	Rack 12	Rack 12	ON	OFF	ON	OFF	ON	ON
			Rack 13	Rack 13	Rack 13	OFF	OFF	ON	OFF	ON	ON
			Rack 14	Rack 14	Rack 14	ON	ON	OFF	OFF	ON	ON
			Rack 15	Rack 15	Rack 15	OFF	ON	OFF	OFF	ON	ON
			Rack 16	Rack 16	Rack 16	ON	OFF	OFF	OFF	ON	ON
			Rack 17	Rack 17	Rack 17	OFF	OFF	OFF	OFF	ON	ON
			Rack 20	Rack 20	Rack 20	ON	ON	ON	ON	OFF	ON
			Rack 21	Rack 21	Rack 21	OFF	ON	ON	ON	OFF	ON
			Rack 22	Rack 22	Rack 22	ON	OFF	ON	ON	OFF	ON
			Rack 23	Rack 23	Rack 23	OFF	OFF	ON	ON	OFF	ON
			Rack 24	Rack 24	Rack 24	ON	ON	OFF	ON	OFF	ON
			Rack 25	Rack 25	Rack 25	OFF	ON	OFF	ON	OFF	ON
			Rack 26	Rack 26	Rack 26	ON	OFF	OFF	ON	OFF	ON
			Rack 27	Rack 27	Rack 27	OFF	OFF	OFF	ON	OFF	ON
				Rack 30	Rack 30	ON	ON	ON	OFF	OFF	ON
				Rack 31	Rack 31	OFF	ON	ON	OFF	OFF	ON
				Rack 32	Rack 32	ON	OFF	ON	OFF	OFF	ON
				Rack 33	Rack 33	OFF	OFF	ON	OFF	OFF	ON
				Rack 34	Rack 34	ON	ON	OFF	OFF	OFF	ON
				Rack 35	Rack 35	OFF	ON	OFF	OFF	OFF	ON
				Rack 36	Rack 36	ON	OFF	OFF	OFF	OFF	ON
				Rack 37	Rack 37	OFF	OFF	OFF	OFF	OFF	ON
					Rack 40	ON	ON	ON	ON	ON	OFF
					Rack 41	OFF	ON	ON	ON	ON	OFF
					Rack 42	ON	OFF	ON	ON	ON	OFF
					Rack 43	OFF	OFF	ON	ON	ON	OFF
					Rack 44	ON	ON	OFF	ON	ON	OFF
					Rack 45	OFF	ON	OFF	ON	ON	OFF
					Rack 46	ON	OFF	OFF	ON	ON	OFF
					Rack 47	OFF	OFF	OFF	ON	ON	OFF
					Rack 50	ON	ON	ON	OFF	ON	OFF

Communicating with FLEX I/O Modules

Chapter Objectives

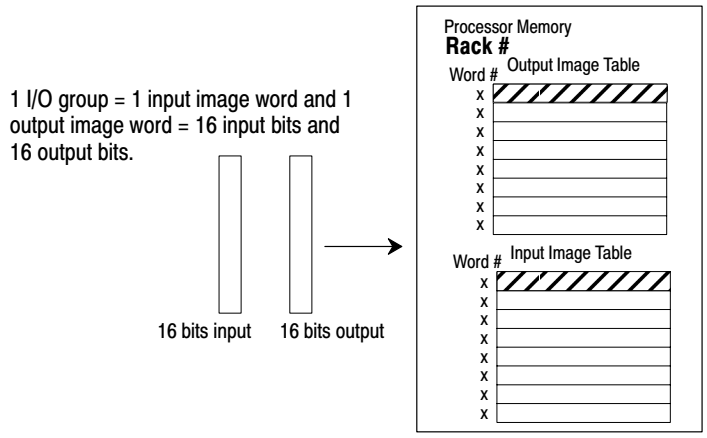
In this chapter, we tell you about:

- addressing your I/O
- what combination of I/O modules and I/O chassis you can use
- I/O image table usage

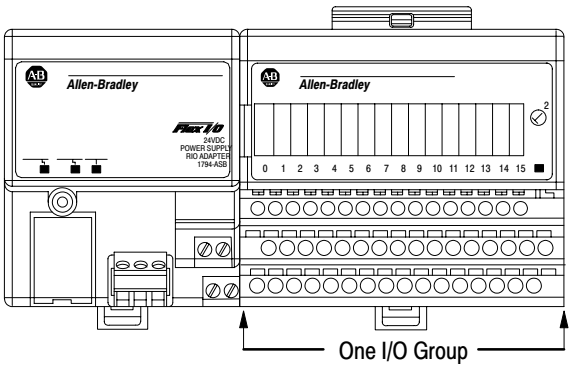
Hardware Addressing

Programmable controllers that use the remote I/O adapter module address their I/O in I/O groups.

For each FLEX I/O chassis in your system, the remote I/O adapter must define how many I/O groups exist (1 word each in the input image table and output image table). With FLEX I/O, each module equals one I/O group – 1 word of input image and 1 word of output image.



Connections to I/O groups are made to I/O terminals (as shown below). An I/O group is an addressing unit that can contain up to 16 input terminals and 16 output terminals.



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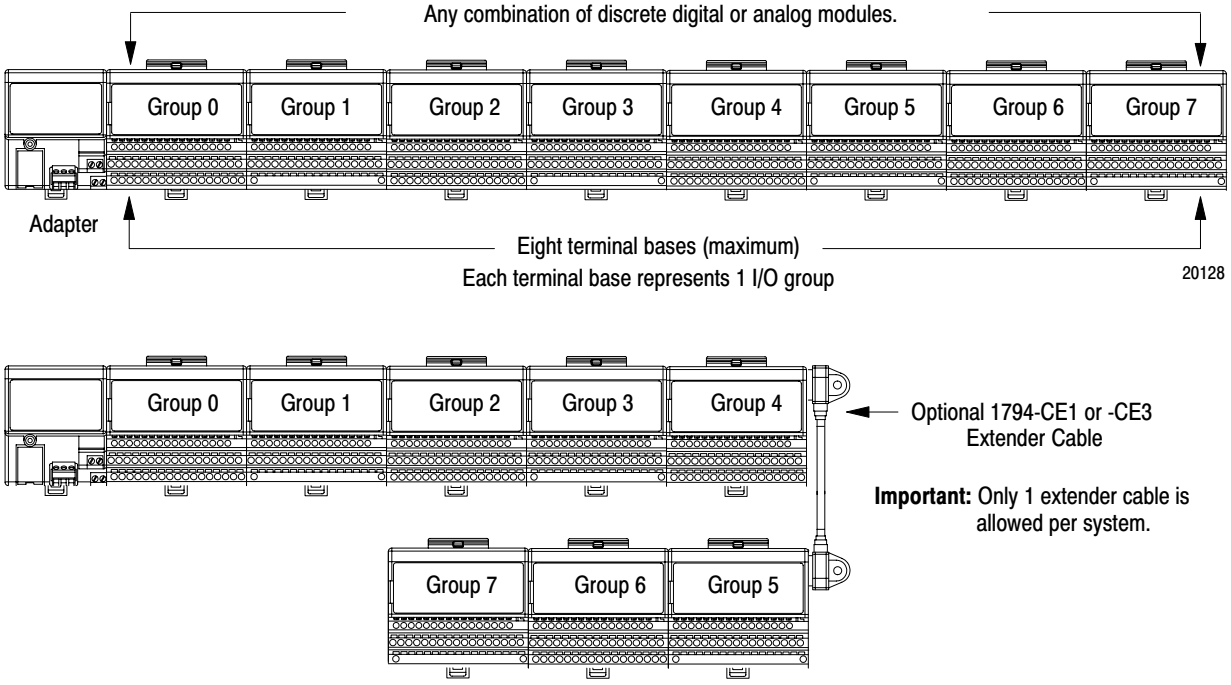
I/O racks are made up of I/O groups. An I/O rack is an addressing unit that can contain up to eight I/O groups.

You can use as many as 8 modules per adapter. This provides a maximum of 128 discrete I/O or 64 analog inputs, or 32 analog output channels.

Figure 1
An I/O Rack - Up to Eight I/O Groups



When using the optional extender cable, modules groups are numbered sequentially along the length of the string.
Do not use the extender cable to connect the adapter to the first module

Determining Rack Size

After the remote I/O adapter has identified the modules present in its system, it creates a "rack image" so data transfer can take place using the remote I/O protocol.

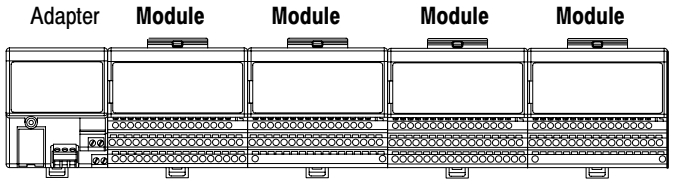
Building a rack image consists of:

- mapping each module to one I/O group (16 bits of input and 16 bits of output)
- determining rack size – all empty terminal bases are counted unless they occur at the end of the rack
- automatically sizing the rack image

ATTENTION: Do not use the auto-config feature of 6200 software when using a PLC-3 processor with 1775-S4A or 1775-S4B scanner modules. If you do an auto-config for a scanner channel containing 1 or more 1794-ASB adapters with that configuration, the adapters may not show up in the scan list for that scanner channel. Manually insert these adapters into the scan list for the scanner.

Some examples of rack definition are shown below.

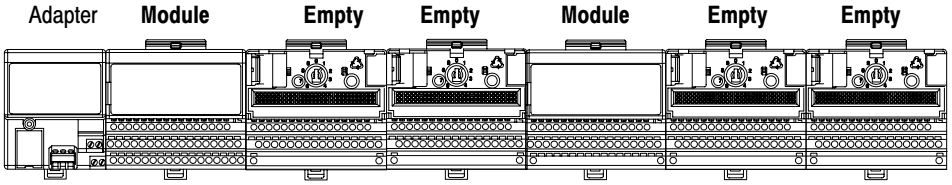
Example 1 – 4 Terminal Bases, 4 Modules



= 1/2 Rack

Each module is equal to 1 I/O group. Therefore, there are 4 I/O groups to be created. Four I/O groups equal 1/2 of a logical rack. The remote I/O adapter will see this configuration as 1/2 of a logical rack

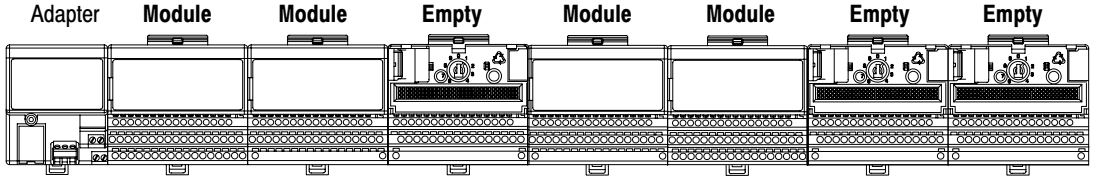
Example 2 – 6 Terminal Bases, 2 Modules



= 1/2 Rack

Each module is equal to 1 I/O group. The first and second empty terminal bases are counted as 1 I/O group each, since they are not at the end of the rack. The third and fourth empty bases are not counted since they are at the end of the rack. Therefore, there are 4 I/O groups to be created. Four I/O groups are equal to 1/2 rack. The remote I/O adapter will see this configuration as 1/2 of a logical rack.

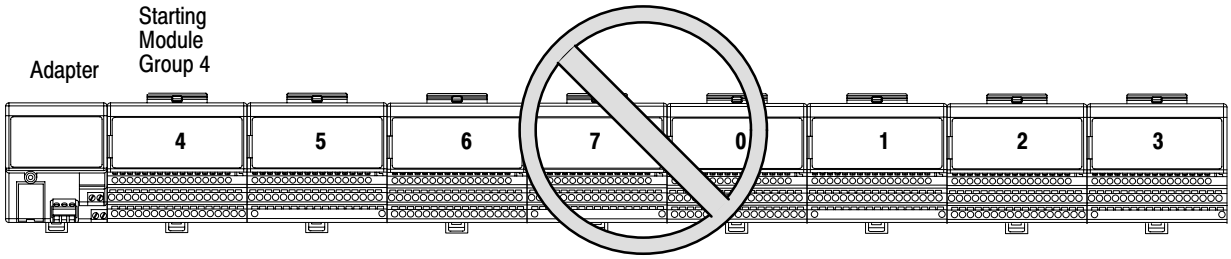
Example 3 – 7 Terminal Bases, 4 Modules



= 3/4 Rack

Each module is equal to 1 I/O group. The first empty terminal base is counted as 1 I/O group since it is not at the end of the rack. The second and third empty bases are not counted since they are at the end of the rack. Therefore, there are 5 I/O groups to be created. Five I/O groups are greater than 1/2 rack but less than 3/4 rack. The remote I/O adapter will see this configuration as the next highest rack, in this case, 3/4 of a logical rack with the last I/O groups not mapped.

Example 4 – Illegal Module Grouping – An illegal grouping consists of more than 1 logical I/O rack attached to 1 adapter. Do not attempt to mix module groups from separate logical I/O rack numbers. All I/O module groups must be in the same logical I/O rack.



Mapping Data into the Image Tables

After the rack size has been determined by the remote I/O adapter, the data from the modules must be mapped into the data tables. Mapping of data into the data table is different for discrete digital and analog modules.

Data transfer to and from the remote I/O adapter and discrete digital modules occurs every flexbus scan. This data is mapped into the input/output image table.

The remote I/O adapter transfers data to analog I/O modules (block transfer write) and from analog I/O modules (block transfer read) using BTW and BTR instructions in your ladder diagram program. This data is mapped to the data files selected in the ladder logic block transfer instructions.

The adapter identifies the type of module in each base unit at powerup, and stores this information for later use, if necessary.

Important: If you are changing your configuration, you must power down, then power back up after changing a module type in a terminal base unit.

ATTENTION: FLEX I/O modules do not support complementary I/O. Do not attempt to use the complementary image table word of a module. The complementary word is reserved for use by the module.

ATTENTION: Do not use the auto-config feature of 6200 software when using a PLC-3 processor with 1775-S4A or 1775-S4B scanner modules. If you do an auto-config for a scanner channel containing 1 or more 1794-ASB adapters with that configuration, the adapters may not show up in the scan list for that scanner channel. Manually insert these adapters into the scan list for the scanner.

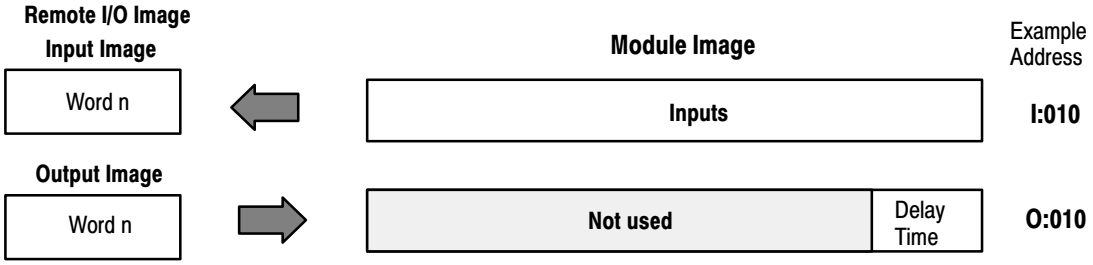
ATTENTION: If the adapter is powered up before analog modules, the adapter will not recognize the analog module. Make certain that analog modules are installed and powered up before or simultaneously with the remote I/O adapter. If the adapter does not establish communication with the analog module, cycle power to the adapter.

Discrete I/O Modules

The adapter determines what type of module is installed in the terminal base unit. If the module is a discrete module, the adapter will read 1 word of input and 1 word of output data.

To see mapping for:	Refer to:
16 Input Discrete Module (1794-IB16	page 3–5
16 Output Discrete Module (1794-OB16)	page 3–6
8 Input Discrete Module (1794-IB8S)	page 3–6
10 Input/6 Output Discrete Combo Module (1794-IB10XOB6)	page 3–7
8 Input Discrete Module (1794-IA8)	page 3–8
8 Output Discrete Module (1794-OA8)	page 3–9
8 Relay Output Discrete Module (1794-OW8)	page 3–9

16-point Discrete Input Module Image Table Mapping – 1794-IB16



Memory Map of 16-Point Discrete Input Module Image Table – 1794-IB16

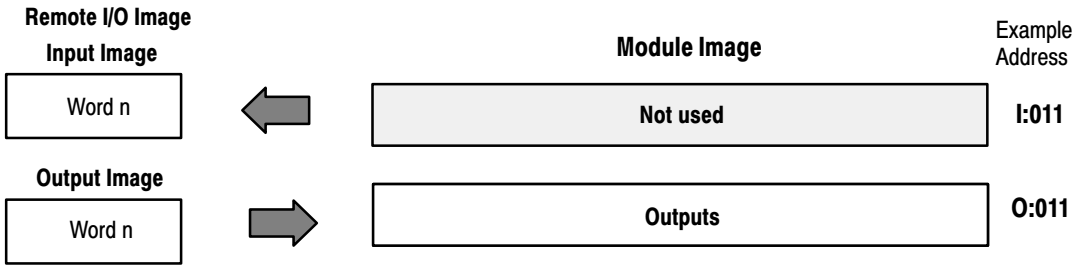
Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	D15	D14	D13	D12	D11	D10	D9	D8	D7	D6	D5	D4	D3	D2	D1	D0
Output word	Not used										DT 12–15 (14–17)			DT 00–11 (00–13)		

Where D = Input Data
DT = Input Delay Time

Input Delay Times for the 1794-IB16 Input Module

Bits			Description	Selected Delay Time
02	01	00	Delay Time for Inputs 00–11 (00–13)	
05	04	03	Delay Time for Inputs 12–15 (14–17)	
0	0	0	Delay Time 0 (default)	512µs
0	0	1	Delay Time 1	1ms
0	1	0	Delay Time 2	2ms
0	1	1	Delay Time 3	4ms
1	0	0	Delay Time 4	8ms
1	0	1	Delay Time 5	16ms
1	1	0	Delay Time 6	32ms
1	1	1	Delay Time 7	64ms

16-point Discrete Output Module Image Table Mapping – 1794-OB16

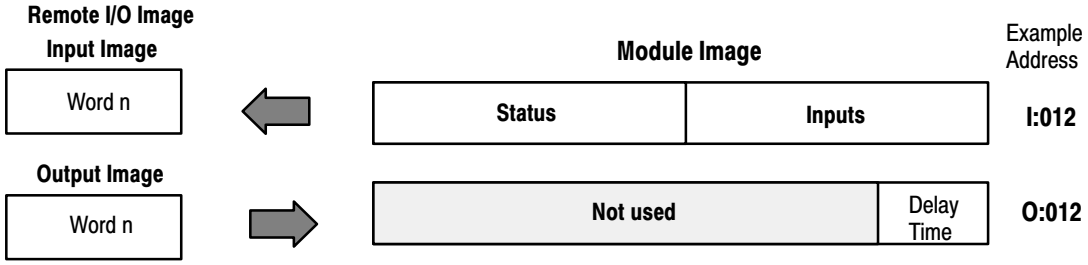


Memory Map of 16-Point Discrete Output Module Image Table – 1794-OB16

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	O15	O14	O13	O12	O11	O10	O9	O8	O7	O6	O5	O4	O3	O2	O1	O0

Where O = Output value

8-point Discrete Input Module Image Table Mapping – 1794-IB8S



Memory Map of 8-Point Discrete Input Module Image Table (with Status) – 1794-IB8S

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	D7	D6	D5	D4	D3	D2	D1	D0	S7	S6	S5	S4	S3	S2	S1	S0
Output word	Not used										DT 12–15 (14–17)			DT 00–11 (00–13)		

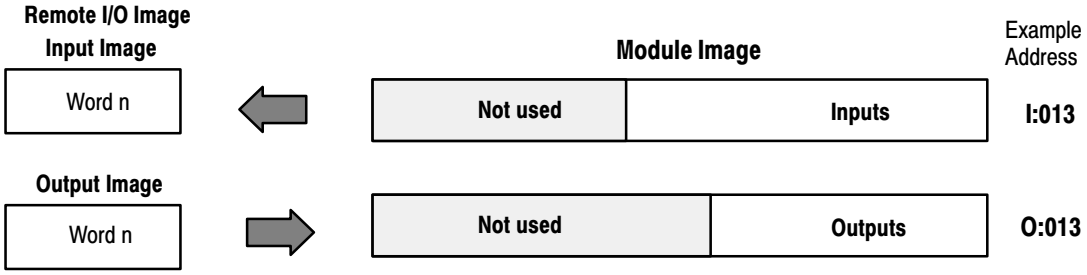
Where S = Status of input
D = Input Data
DT = Input Delay Time

Smart Sensor (such as Allen-Bradley Series 9000 Heartbeat Sensors)			
Bits 08–15 (10–17)	D = Diagnostic data – 1 = Fault present (Smart) 0 = Normal (no errors)	Bits 00–07 (00–07)	S = Input data 1 = Sensor on 0 = Sensor off
Standard Sensor			
Bits 08–15 (10–17)	D = Diagnostic data – 1 = Diagnostics not disabled 0 = Normal (Disabled)	Bits 00–07 (00–07)	S = Input data 1 = Sensor on 0 = Sensor off

Input Delay Times for the 1794-IB8S Input Module

Bits			Description	Selected Delay Time
02	01	00	Delay Time for Inputs 00–11 (00–13)	
05	04	03	Delay Time for Inputs 12–15 (14–17)	
0	0	0	Delay Time 0 (default)	512µs
0	0	1	Delay Time 1	1ms
0	1	0	Delay Time 2	2ms
0	1	1	Delay Time 3	4ms
1	0	0	Delay Time 4	8ms
1	0	1	Delay Time 5	16ms
1	1	0	Delay Time 6	32ms
1	1	1	Delay Time 7	64ms

16-point Discrete Input/Output Module Image Table Mapping – 1794-IB10XOB6

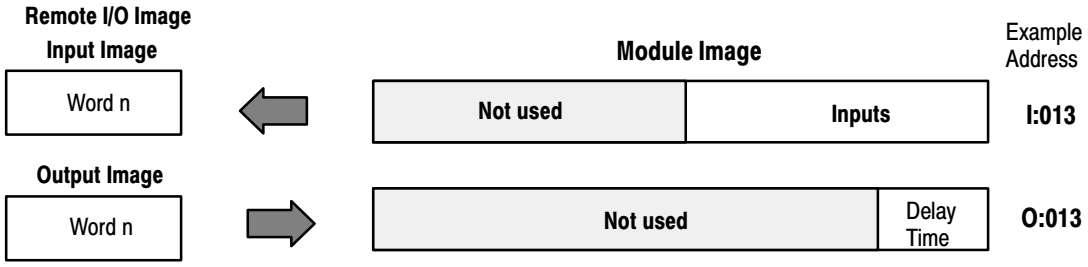


Memory Map of 16-Point Discrete Input/Output Module Image Table – 1794-IB10XOB6

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input Word	Not used						I9	I8	I7	I6	I5	I4	I3	I2	I1	I0
Output Word	Not used										O5	O4	O3	O2	O1	O0

Where I = Input Channel
O = Output Channel

8-point Discrete Input Module Image Table Mapping – 1794-IA8



Memory Map of 8-point Discrete Input Module Image Table – 1794-IA8

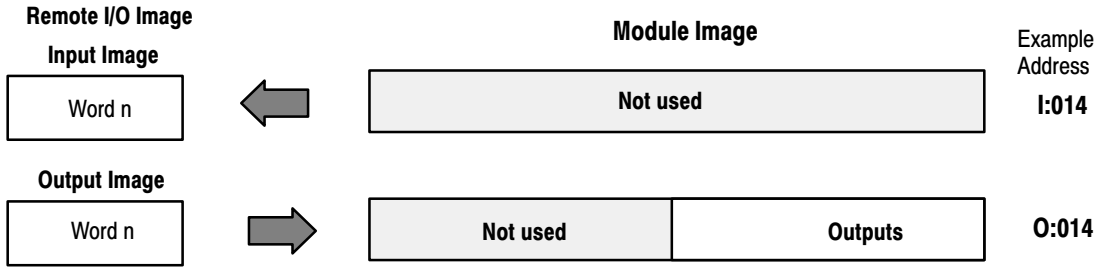
Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used								D7	D6	D5	D4	D3	D2	D1	D0
Output word	Not used										DT 12–15 (14–17)			DT 00–11 (00–13)		

Where D = Input Data
DT = Input Delay Time

Input Delay Times for the 1794-IA8 Input Module

Bits			Description	Maximum Delay Time	
02	01	00	Delay Time for Inputs 00–07	Off to On	On to Off
0	0	0	Delay Time 0 (default)	8.6ms	26.6ms
0	0	1	Delay Time 1	9ms	27ms
0	1	0	Delay Time 2	10ms	28ms
0	1	1	Delay Time 3	12ms	30ms
1	0	0	Delay Time 4	17ms	35ms
1	0	1	Delay Time 5	26ms	44ms
1	1	0	Delay Time 6	43ms	61ms
1	1	1	Delay Time 7	78ms	96ms

8-point Discrete Output Module Image Table Mapping – 1794-OA8

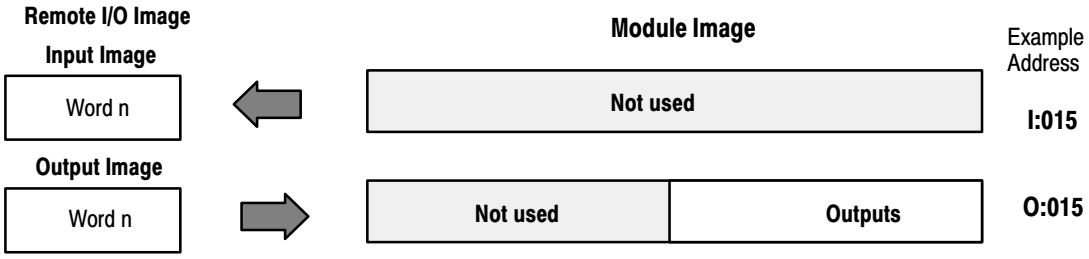


Memory Map of 8-Point Discrete Output Module Image Table – 1794-OA8

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	Not used								O7	O6	O5	O4	O3	O2	O1	O0

Where O = Output value

8-point Discrete Relay Output Module Image Table Mapping – 1794-OW8



Memory Map of 8-Point Discrete Output Module Image Table – 1794-OW8

Decimal Bits	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
(Octal Bits)	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Input word	Not used															
Output word	Not used								O7	O6	O5	O4	O3	O2	O1	O0

Where O = Output value: when bit = 0, output is off; when bit = 1, output is on.

Analog I/O Modules

At powerup, the adapter identifies the type of module installed in the base unit. If the module is an analog module, the adapter will access 15 words of data.

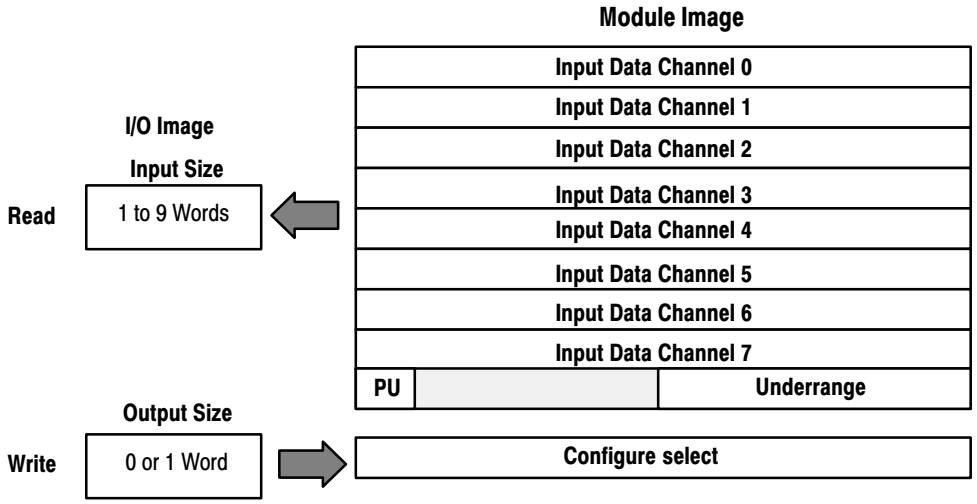
ATTENTION: If using Series A modules, do not use configure select and full range bit settings of 0. Individual channels revert to 4–20mA with bit selections of all zeroes. This could result in unwanted or incorrect action.

ATTENTION: The series A adapters and the series B adapters process block transfers differently. Series A adapters allow block transfers to continue to occur even when an analog module is removed from its base. With series B adapters, when a module is removed from its terminal base, the series B adapter ceases to do block transfers to the processor. This provides feedback to the processor that a block transfer module has been removed.
The “hold inputs” feature, selectable on the switch assembly on the adapter, does not apply to analog modules. If you need this feature, you must simulate it in your programming.

ATTENTION: If the adapter is powered up before analog modules, the adapter will not recognize the analog module. Make certain that analog modules are installed and powered up before or simultaneously with the remote I/O adapter. If the adapter does not establish communication with the analog module, cycle power to the adapter.

To see mapping for:	Refer to:
8 input analog module (1794-IE8/B)	page 3–11
4 output analog module (1794-OE4/B)	page 3–12
4 input/2 output analog combo module (1794-IE4XOE2/B)	page 3–14
8 RTD input module (1794-IR8)	page 3–16
8 Thermocouple/mV input module (1794-IT8)	page 3–17

8 Input Analog Module (Cat. No. 1794-IE8 Series B)



Analog Input Module (1794-IE8/B) Read

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Word 0	S	Analog Value Channel 0														
Word 1	S	Analog Value Channel 1														
Word 2	S	Analog Value Channel 2														
Word 3	S	Analog Value Channel 3														
Word 4	S	Analog Value Channel 4														
Word 5	S	Analog Value Channel 5														
Word 6	S	Analog Value Channel 6														
Word 7	S	Analog Value Channel 7														
Word 8	PU	Not used – set to zero							U7	U6	U5	U4	U3	U2	U1	U0

Where: S = sign bit (in 2's complement)
U = Underrange bits for 4-20mA inputs
PU = Power up bit (Included in series B modules; this bit is 0 in series A modules.)

Analog Input Module (1794-IE8/B) Write Configuration Block

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Word 0	C7	C6	C5	C4	C3	C2	C1	C0	F7	F6	F5	F4	F3	F2	F1	F0

Where: C = Configure select bit
F = Full range bit

Range Selection Bits for the 1794-IE8/B Analog Input Module

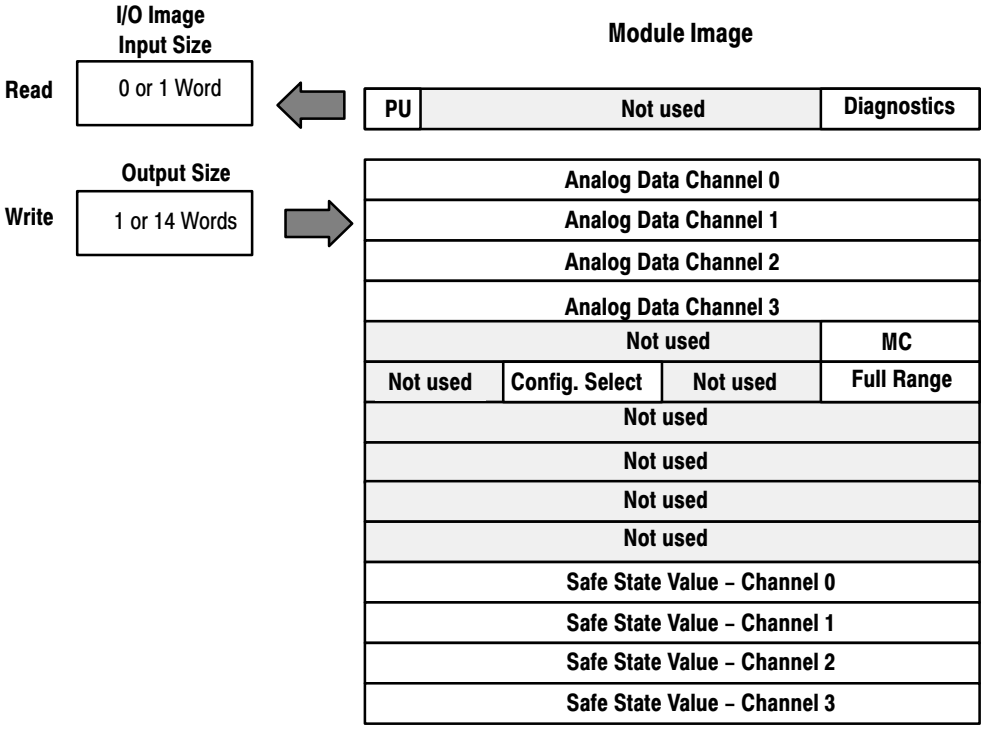
Channel No.	Channel 0		Channel 1		Channel 2		Channel 3		Channel 4		Channel 5		Channel 6		Channel 7	
	F0	C0	F1	C1	F2	C2	F3	C3	F4	C4	F5	C5	F6	C6	F7	C7
Decimal Bits (Octal Bits)	00	08 (10)	01	09 (11)	02	10 (12)	03	11 (13)	04	12 (14)	05	13 (15)	06	14 (16)	07	15 (17)
0–10V dc/0–20mA	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0
4–20mA	0	1	0	1	0	1	0	1	0	1	0	1	0	1	0	1
-10 to +10V dc	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Off[1]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

C = Configure select bit

F = Full range bit

1 When configured to off, individual channels will return 0000H on Series B modules, and 4 to 20mA on Series A modules.

4 Output Analog Module (Cat. No. 1794-OE4 Series B)



Analog Output Module (1794-OE4) Read

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Read Word 0	PU	Not used – set to 0											W3	W2	W1	W0

Where: W = Diagnostic bits for current output – wire broken or load resistance high. (4-20mA mode only. Not used on voltage outputs.)
PU = Power up bit (Included in series B modules; this bit is 0 in series A modules.)

Analog Output Module (1794-OE4/B) Write Configuration Block

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Write Word 0	S	Analog Data – Channel 0														
Word 1	S	Analog Data – Channel 1														
Word 2	S	Analog Data – Channel 2														
Word 3	S	Analog Data – Channel 3														
Word 4	0	Not used – set to 0											M3	M2	M1	M0
Word 5	0	Not used – set to 0			C3	C2	C1	C0	Not used – set to 0				F3	F2	F1	F0
Word 6 thru 9	Not used – set to 0															
Word 10	S	Safe State Value – Channel 0														
Word 11	S	Safe State Value – Channel 1														
Word 12	S	Safe State Value – Channel 2														
Word 13	S	Safe State Value – Channel 3														

Where: S = Sign bit (in 2's complement)
M = Multiplex control
C = Configure select bit
F = Full range bit

Range Selection Bits for the 1794-OE4/B Analog Output Module (Word 5)

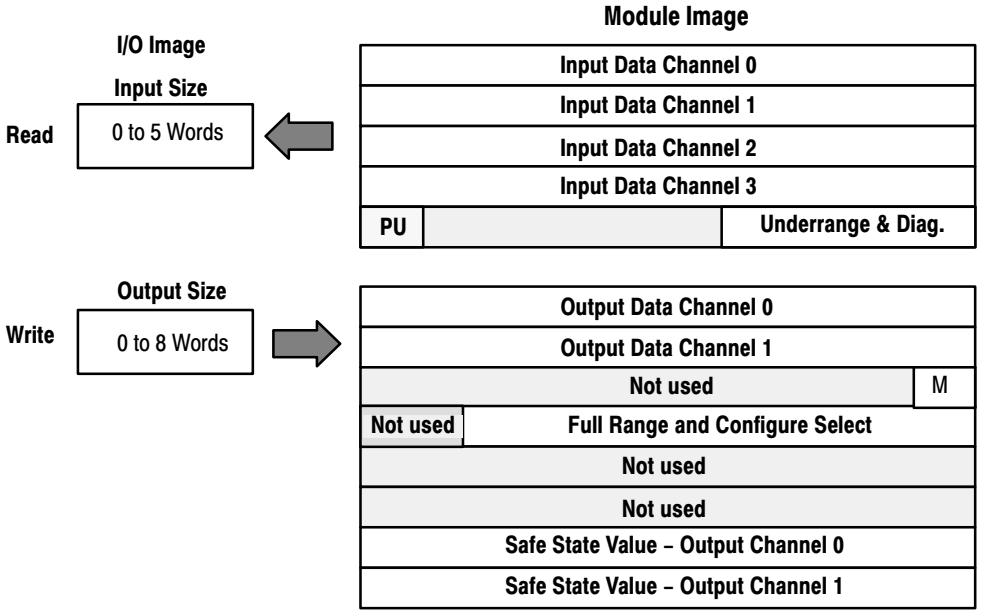
Channel No.	Channel 0		Channel 1		Channel 2		Channel 3	
	F0	**C0**	**F1**	**C1**	**F2**	**C2**	**F3**	**C3**
Decimal Bits (Octal Bits)	**00**	**08 (10)**	**01**	**09 (11)**	**02**	**10 (12)**	**03**	**11 (13)**
4–20mA	0	1	0	1	0	1	0	1
0–10V dc/0–20mA	1	0	1	0	1	0	1	0
-10 to +10V dc	1	1	1	1	1	1	1	1
Off[1]	0	0	0	0	0	0	0	0

C = Configure select bit

F = Full range bit

[1] When configured to off, individual channels will send 0V or 0mA on Series B modules. On Series A modules, 2V or 4mA is output until the module is configured.

4 Input/2 Output Analog Combo Module (Cat. No. 1794-IE4XOE2 Series B)



Analog Combo Module (1794-IE4XOE2/B) Read

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Read Word 0	S	Analog Value Input Channel 0														
Word 1	S	Analog Value Input Channel 1														
Word 2	S	Analog Value Input Channel 2														
Word 3	S	Analog Value Input Channel 3														
Word 4	PU	Not used – set to 0									W1	W0	U3	U2	U1	U0

Where: S = sign bit (in 2's complement)
W = Diagnostic bits for current output wire broken or load resistance high. (Not used on voltage outputs.)
U = Underrange bits for 4-20mA inputs
PU = Power up bit (Included in series B modules; this bit is 0 in series A modules.)

Analog Combo Module (1794-IE4XOE2/B) Write Configuration Block

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Write Word 0	S	Analog Data – Output Channel 0														
Word 1	S	Analog Data – Output Channel 1														
Word 2	0	Not used – set to 0													M1	M0
Word 3	Not used		C5	C4	C3	C2	C1	C0	0	0	F5	F4	F3	F2	F1	F0
Words 4 and 5	Not used – set to 0															
Word 6	S	Safe State Value – Output Channel 0														

Word/Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Word/Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Word 7	S	Safe State Value – Output Channel 1														

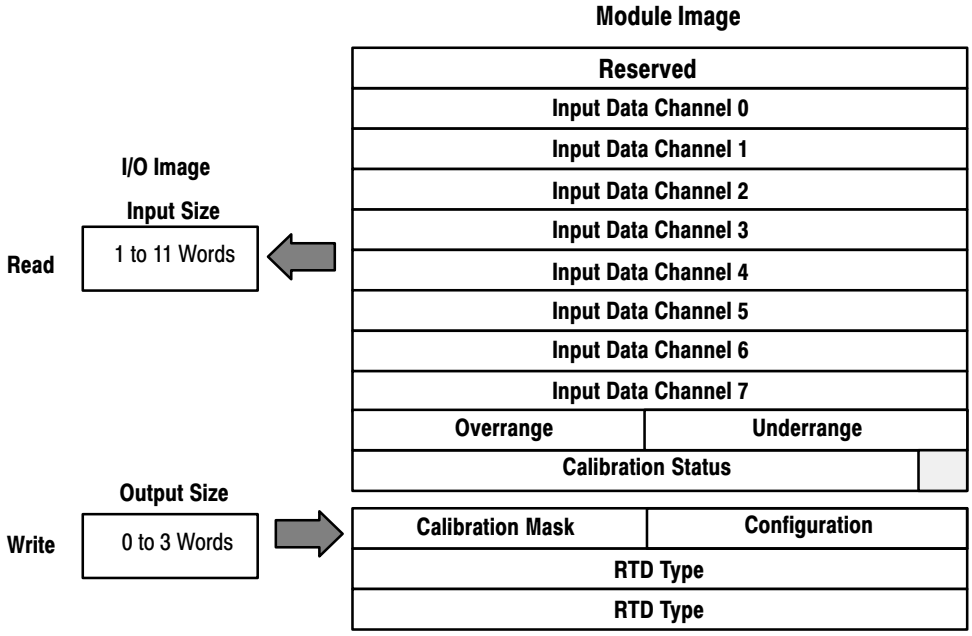
Where: S = Sign bit (in 2's complement)
M = Multiplex control
C = Configure select bit
F = Full range bit

Range Selection Bits for the 1794-IE4XOE2/B Analog Combo Module

Channel No.	Input Channel 0		Input Channel 1		Input Channel 2		Input Channel 3		Output Channel 0		Output Channel 1	
	F0	C0	F1	C1	F2	C2	F3	C3	F4	C4	F5	C5
Decimal Bits (Octal Bits)	00	08 (10)	01	09 (11)	02	10 (12)	03	11 (13)	04	12 (14)	05	13 (15)
4–20mA	0	1	0	1	0	1	0	1	0	1	0	1
0–10V dc/0–20mA	1	0	1	0	1	0	1	0	1	0	1	0
-10 to +10V dc	1	1	1	1	1	1	1	1	1	1	1	1
Off[1]	0	0	0	0	0	0	0	0	0	0	0	0

C = Configure select bit
F = Full range bit
1 When configured to off, individual channels will send 0V or 0mA on Series B modules. On Series A modules, 2V or 4mA is output until the module is configured.

RTD Input Module (1794-IR8) Image Table Mapping



RTD Analog Input Module (1794-IR8) Read Words

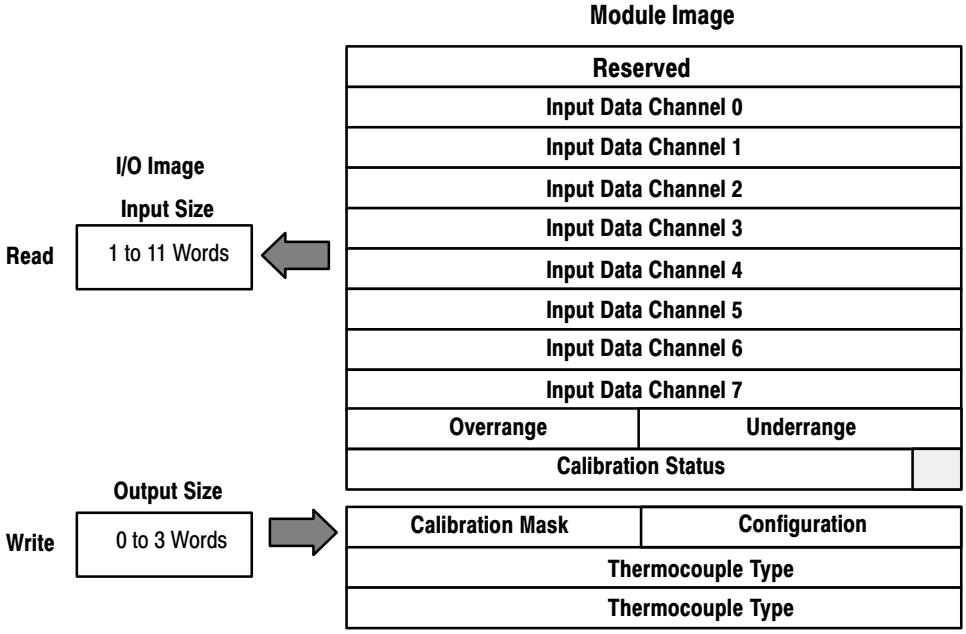
Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Read Word 0	Reserved															
1	Channel 0 Input Data															
2	Channel 1 Input Data															
3	Channel 2 Input Data															
4	Channel 3 Input Data															
5	Channel 4 Input Data															
6	Channel 5 Input Data															
7	Channel 6 Input Data															
8	Channel 7 Input Data															
9	Overrange Bits								Underrange Bits							
10	0	0	0	0	0	Bad Cal	Cal Done	Cal Range	0	Diagnostic Status Bits			Pwr Up	Reserved	0	0

RTD Analog Input Module (1794-IR8) Write Words

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Write Word 0	8-bit Calibration Mask								Cal Clk	Cal Hi Cal Lo	Filter Cutoff			Enh	MDT	
1	RTD 3 Type				RTD 2 Type				RTD 1 Type				RTD 0 Type			
2	RTD 7 Type				RTD 6 Type				RTD 5 Type				RTD 4 Type			

Where: Enh = Enhanced
MDT = Module Data Type

Thermocouple/mV Input Module (1794-IT8) Image Table Mapping



Thermocouple/mV Input Module (1794-IT8) Read

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	17	16	15	14	13	12	11	10	07	06	05	04	03	02	01	00
Read Word 0	Reserved															
1	Channel 0 Input Data															
2	Channel 1 Input Data															
3	Channel 2 Input Data															
4	Channel 3 Input Data															
5	Channel 4 Input Data															
6	Channel 5 Input Data															
7	Channel 6 Input Data															
8	Channel 7 Input Data															

Decimal Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
9	Overrange Bits								Underrange Bits							
10	0	0	0	0	0	Bad Cal	Cal Done	Cal Range	0	Diagnostic Status			Pwr Up	Bad Structure	CJC over	CJC Under

Thermocouple/mV Input Module (1794-IT8) Write

Dec. Bit	15	14	13	12	11	10	09	08	07	06	05	04	03	02	01	00
Octal Bit	**17**	**16**	**15**	**14**	**13**	**12**	**11**	**10**	**07**	**06**	**05**	**04**	**03**	**02**	**01**	**00**
Write Word 0	8-Bit Calibration Mask								Cal Clk	Cal hi Cal lo	Filter Cutoff			FDF	Data Type	
1	Thermocouple 3 Type				Thermocouple 2 Type				Thermocouple 1 Type				Thermocouple 0 Type			
2	Thermocouple 7 Type				Thermocouple 6 Type				Thermocouple 5 Type				Thermocouple 4 Type			

Where: FDF = fixed digital filter bit

Operating Modes

Most reset commands are issued by the processor when it is placed in the PROG mode. However, the processor automatically issues a special command to any rack declared faulted regardless of the processor mode.

When this special command is received by the faulted remote I/O adapter, and processor restart lockout (PRL) has not been selected, the adapter will:

- continue to read output image data from the link, and queue block transfers if MCBs are detected
- reset all bits in the output words of discrete modules
- reset all bits in the write words of analog modules up to but not including the write words of the safe state values
- assigns safe state values to outputs of analog modules
- issue a reply command

If processor restart lockout (PRL) has been selected, the adapter does not update data, does not issue a reply command, and does not clear the fault.

Chapter Summary

In this chapter, you learned how to address your I/O, how to determine rack size, and how the modules are mapped

Troubleshooting

Chapter Objectives

In this chapter, we tell you:

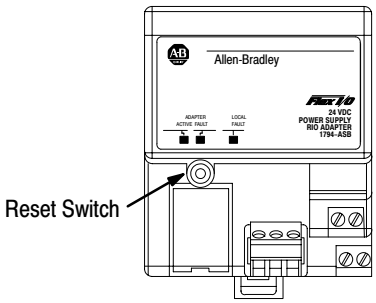
- about the indicators on the module front plate
- how to use the indicators for troubleshooting the module

Fault Conditions

Two conditions can cause the remote I/O adapter to declare a link (remote I/O) fault:

- no link activity for more than 100ms
- no commands issued to this address within the last 255 link transactions

When either of these conditions exist, the adapter will:



- reset all outputs or leave them in their last state (depending on the position of the last state switch, **S2-1**)

A link fault will be automatically cleared by a command from the processor if PRL (processor restart lockout) is not selected, or by pressing the reset switch on the front of the module if PRL is selected.

Important: Cycling power to the adapter will also reset faults. However, any queued block transfers will be lost, and all outputs will turn off, regardless of the position of the last state switch.

Troubleshooting with the Indicator Lights

The module has indicators on the front plate as shown below. Use these indicators for troubleshooting the module. The following tables describes problems that may occur, probable causes, and recommended courses of action.

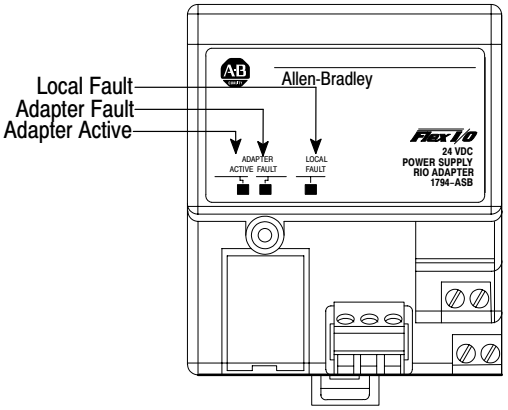
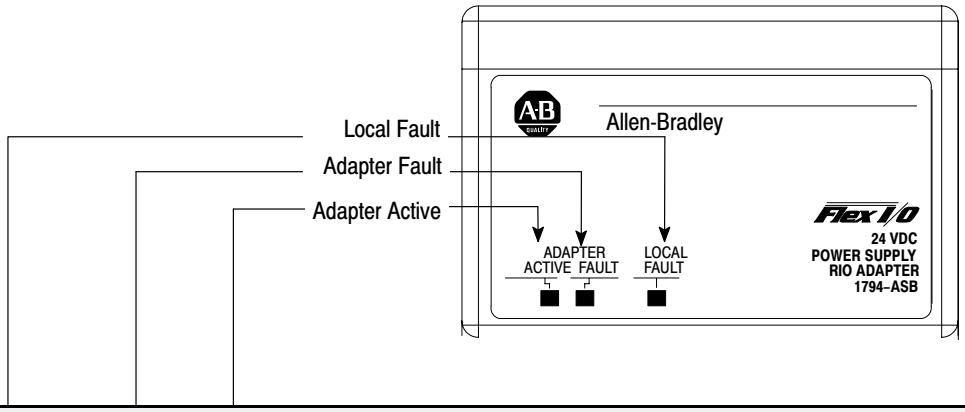


Table 4.A
Remote I/O System Troubleshooting Guide



Communication States and Module Display

Local Fault	Adapter Fault	Adapter Active	Operating State	Actions	Fault Reset
Off	Off	On	Normal Communications	Outputs enabled. Communicating with scanner	Not applicable
Off	Off	Blinking	Program/Test mode	Outputs disabled Communicating with scanner Sending current input status back to scanner.	Not applicable
Off	Off	Off	Communication (lack of communications)	Outputs follow last state switch setting	Resume proper communications (if no processor restart lockout)
Off	Blinking alternately		Processor lockout in effect during communications by scanner	Outputs follow last state switch setting. No replies sent to scanner	Press Reset button on front of adapter module (or cycle power) and resume proper communication.

Module Faults

Local Fault	Adapter Fault	Adapter Active	Fault Condition	Actions	Fault Reset
On	On	Off	Noise problems on I/O bus	All outputs off. Communications off.	Cycle power. (This fault is a fatal fault.)
On	Off	Following Link Status	Different module installed replacing removed module.	Old inputs maintained. Outputs set to zero.	Auto-reset when incorrect module is removed; or cycle power to establish new identification for module.
Blinking	Off	Following Link Status	Module not responding. Possibly module removed under power.	Old inputs maintained. Outputs set to zero.	Replace same module; or cycle power to establish new identification for module.

Configuration Faults

Local Fault	Adapter Fault	Adapter Active	Fault Condition	Actions	Fault Reset
Off	Blinking in unison		Incorrect starting I/O group number.	Not applicable.	Turn power off. Set SW1 and SW2 correctly. Turn power on.
On	On	On	Incorrect baud rate setting.		
Blinking in sequence			Another adapter on the link has the same address.		

Additional Faults and Module Displays					
Local Fault	**Adapter Fault**	**Adapter Active**	**Fault Condition**	**Actions**	**Fault Reset**
Off	On	Off	Random Access Memory fault.	Reset outputs. Stop communicating on remote I/O link.	Cycle power. (This may not correct fault.) If this does not correct the fault, replace the module with a known good module, and return the bad module to the factory for repair.
			Read Only Memory fault (on powerup only).	Outputs remain reset. Communication never starts.	
			Internal watchdog timer timed out.	Try to reset outputs. Stops communicating on the remote I/O link.	

Chapter Summary

In this chapter you learned how to use the indicators on the front of the module to troubleshoot your module.

Specifications

1794-ASB Remote I/O Adapter	
I/O Capacity	8 modules
Input Voltage Rating	24V dc nominal
Input Voltage Range	19.2V to 31.2V dc (includes 5% ac ripple)
Communication Rate	57.6k bps 115.2k bps 230.4k bps
Indicators	Adapter Active – green Adapter fault – red Local fault – red
Flexbus Output Current	640mA maximum
Isolation Voltage	100% tested at 850V dc for 1s between user power and flexbus
Power Consumption	450mA maximum from external 24V supply
Power Dissipation	4.6W maximum @ 31.2V dc
Thermal Dissipation	15.7 BTU/hr @ 31.2V dc
Environmental Conditions Operational Temperature Storage Temperature Relative Humidity Shock Operating Non-operating Vibration	 0 to 55°C (32 to 131°F) –40 to 85°C (–40 to 185°F) 5 to 95% noncondensing 30 g peak acceleration, 11(+1)ms pulse width 50 g peak acceleration, 11(±1)ms pulse width Tested 5 g @ 10–500Hz per IEC 68-2-6
Remote I/O Cable	Belden 9463 or equivalent as specified in publication ICCG-2.2
Power Conductors Wire Size Category	 12 gauge ($4mm^2$) stranded maximum 3/64 inch (1.2mm) insulation max. 2[1]
Remote I/O Connector Plug	Part Number 942029–03
Agency Certification (when product or packaging is marked)	• CSA certified • CSA Class I, Division 2 Groups A, B, C, D certified • UL listed • CE marked for all applicable directives

[1] Use this conductor category information for planning conductor routing. Refer to publication 1770-4.1, "Industrial Automation Wiring and Grounding Guidelines for Noise Immunity."

S

T

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Publication Problem Report

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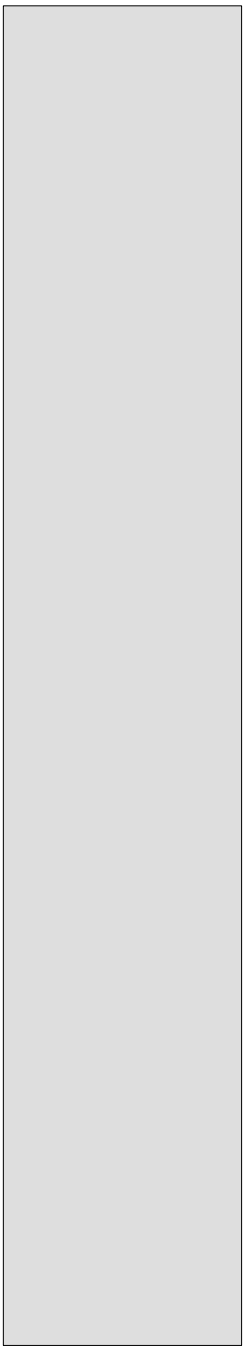

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Cat. No. **1794-ASB/B** Pub. No. **1794-6.5.3** Pub. Date **May 1996** Part No. **955122-64**

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